

PCT

Annex to the Request

International Application No.

CF/10093-002

Date stamp of the receiving Office

Groupe Réfraco inc.

1. TRANSMITTAL FEE

300.00 T

2. SEARCH FEE

1600.00 S

International search to be carried out by

CA

(If two or more International Searching Authorities are competent to carry out the international search, indicate the name of the Authority which is chosen to carry out the international search.)

3. INTERNATIONAL FILING FEE

Where items (b) and/or (c) of Box No. IX apply, enter Sub-total number of sheets } 65
Where items (b) and (c) of Box No. IX do not apply, enter Total number of sheets } _____

i1	first 30 sheets	1489.00	i1
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$$\boxed{i2} \frac{35}{\text{number of sheets in excess of 30}} \times \frac{16}{\text{fee per sheet}} = \boxed{560.00} \boxed{i2}$$

i3 additional component (only if sequence listing and/or tables related thereto are filed in computer readable form under Section 801(a)(i), or both in that form and on paper, under Section 801(a)(ii)):

400 x = i3
fee per sheet

Add amounts entered at i1, i2 and i3 and enter total at I	2049.00	I
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(Applicants from certain States are entitled to a reduction of 75% of the international filing fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at 1 is 25% of the international filing fee.)

4. FEE FOR PRIORITY DOCUMENT (if applicable)

5. TOTAL FEES PAYABLE

Add amounts entered at T, S, I and P, and enter total in the TOTAL box

☐ authorization to charge
deposit account (see below)☐ postal money order☐ cash

☐ coupons

 cheque

☐ bank draft

☐ revenue stamps

☒ other (specify): credit card

AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT

(This mode of payment may not be available at all receiving Offices)

☐ Authorization to charge the total fees indicated above.

☐ (This check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.

☐ Authorization to charge the fee for priority document.

Receiving Office: RO/

Deposit Account No.: _____

Date: _____

Name: _____

Signature: _____

NOTES TO THE FEE CALCULATION SHEET
(ANNEX TO FORM PCT/RO/101)

The purpose of the fee calculation sheet is to help the applicant to identify the prescribed fees and to calculate the amounts to be paid. It is strongly recommended that the applicant complete the sheet by entering the appropriate amounts in the boxes provided and submit the fee calculation sheet at the time of filing the international application. This will help the receiving Office to verify the calculations and to identify any error in them.

Information about the applicable fees payable can be obtained from the receiving Office. The amounts of the international filing and search fees may change due to currency fluctuations. Applicants are advised to check what are the latest applicable amounts. All fees, must be paid within one month from the date of receipt of the international application.

CALCULATION OF PRESCRIBED FEES

Box T: Transmittal Fee for the benefit of the receiving Office (Rule 14.1): The amount of the transmittal fee, if any, is fixed by the receiving Office. It must be paid within one month from the date of receipt of the international application by the receiving Office. Information about this fee is contained in the *PCT Applicant's Guide*, Volume I/B, Annex C.

Box S: Search Fee for the benefit of the International Searching Authority (ISA) (Rule 16.1): The amount of the search fee is fixed by the ISA. It must be paid within one month from the date of receipt of the international application by the receiving Office. Information about this fee is contained in the *PCT Applicant's Guide*, Volume I/B, Annex D.

Where two or more ISAs are competent, the applicant must indicate his choice in the space provided for this purpose and pay the amount of the international search fee fixed by the ISA chosen. Information on the competent ISA and whether the applicant has a choice between two or more ISAs is contained in the *PCT Applicant's Guide*, Volume I/B, Annex C.

Box I: International Filing Fee for the benefit of the International Bureau (Rule 15): The amount of the international filing fee is as set out in Swiss francs in the Schedule of Fees and the applicable amount of this fee in other currencies is as published in the *PCT Gazette* (Rule 15.2). Information about this fee is also contained in the *PCT Applicant's Guide*, Volume I/B, Annex C.

Reduction of the International Filing Fee Where PCT-EASY Software Is Used: A fee reduction of 100 Swiss francs (or the equivalent in the currency in which the international filing fee is paid to the receiving Office) is available in certain cases where the PCT-EASY software is used to prepare the request, provided that the necessary conditions are met. For further details, see the *PCT Applicant's Guide*, Volume I/A, General Part, and Volume I/B, Annex C, as well as information published in the *PCT Gazette* and the *PCT Newsletter*. Since applicants using the PCT-EASY software will file the Request Form and Fee Calculation Sheet in the form of a printout prepared using that software, no provision is made for this fee reduction in the Fee Calculation Sheet annexed to Form PCT/RO/101.

Reduction of the International Filing Fee Where the International Application Is Filed in Electronic Form: The international filing fee is reduced by 200 Swiss francs (or the equivalent in the currency in which the international filing fee is paid to the receiving Office) if the international application is, in accordance with and to the extent provided for in Part 7 and Annex F of the Administrative Instructions, filed in electronic form where the text of the description, claims and abstract is not in character coded format, or by 300 Swiss francs (or the equivalent in the currency in which the international filing fee is paid to the receiving Office) where the international application is filed in electronic form where the text of the description, claims and abstract is in character coded format. For further details, see the *PCT Applicant's*

Guide, Volume I/A, General Part, and Volume I/B, Annex C, as well as information published in the *PCT Gazette* and the *PCT Newsletter*. Since international applications filed in electronic form will contain the Request Form and Fee Calculation Sheet in such electronic form, no provision is made for this fee reduction in the Fee Calculation Sheet annexed to Form PCT/RO/101.

Reduction of the International Filing Fee for Applicants from Certain States: An applicant who is a natural person and who is a national of and resides in a State whose per capita national income is below 3,000 US dollars (according to the average per capita national income figures used by the United Nations for determining its scale of assessments for the contributions payable for the years 1995, 1996 and 1997) or an applicant, whether a natural person or not, who is a national of and resides in a State that is classed as a least developed country by the United Nations, is entitled, to a reduction of 75% of certain PCT fees including the international filing fee. If there are several applicants, each must satisfy the above-mentioned criteria. The reduction of the international filing fee is automatically available to any applicant (or applicants) who is (or are) so entitled on the basis of the indications of name, nationality and residence given in Boxes Nos. II and III of the request.

The fee reduction is available even if one or more of the applicants are not from PCT Contracting States, provided that each of them is a national and resident of a State that meets the above-mentioned requirements and that at least one of the applicants is a national or resident of a PCT Contracting State and thus is entitled to file an international application.

Information about PCT Contracting States whose nationals and residents are entitled to a reduction of 75% of certain PCT fees, including the international filing fee, is contained in the *PCT Applicant's Guide*, Volume I/B, Annex C and on the WIPO Website (see <http://www.wipo.int/pct/en/index.html>), and is also published and regularly updated in the *PCT Gazette* and the *PCT Newsletter*.

Calculation of the International Filing Fee in Case of Fee Reduction: Where the applicant is (or all applicants are) entitled to a reduction of the international filing fee, the total to be entered in box I is 25% of the international filing fee (see below).

Box I: International Filing Fee: The amount of the international filing fee depends on the number of sheets of the international application indicated under item (a) of Box No. IX of the request as explained below.

That number is the **Total number of sheets** where items (b) and (c) of Box No. IX of the request do not apply (that is, where the international application either does not contain a sequence listing and/or tables related thereto or where it contains such listing and/or tables but not filed in computer readable form under Section 801(a)(i) or (ii)); in such a case, item "i3" must not be filled in.

Otherwise, where items (b) and/or (c) of Box No. IX of the request apply (that is, where the international application contains a sequence listing and/or tables related thereto which are filed in computer readable form only, under Section 801(a)(i), or both in that form and in paper form under Section 801(a)(ii)), the number of sheets to be used for the purpose of calculating the amount of the international filing fee is the **Sub-total number of sheets**. In such a case, item "j3" must be filled in on the basis that the sequence listing and/or tables related thereto in computer readable form are considered to be equal to 400 sheets (see Section 803).

The international filing fee must be paid within one month from the date of receipt of the international application by the receiving Office.

Box P: Fee for Priority Document (Rule 17.1(b)): Where the applicant has requested, by marking the applicable check-box in Box No. VI of the request, that the receiving Office prepare and transmit to the International Bureau a certified copy of the earlier application the priority of which is claimed, the amount of the fee prescribed by the receiving Office for such service may be entered (for information, see the *PCT Applicant's Guide*, Volume I/B, Annex C).

If that fee is not paid at the latest before the expiration of 16 months from the priority date, the receiving Office may consider the request under Rule 17.1(b) as not having been made.

Total Box: The total of the amounts entered in boxes T, S, I and P should be entered in this box. If the applicant so wishes, the currency in which the fees are paid may be indicated next to or in the total box.

MODE OF PAYMENT

In order to help the receiving Office identify the mode of payment of the prescribed fees, it is recommended that the applicable check-box(es) be marked.

AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT

The receiving Office will not charge (or credit) fees to deposit accounts unless the deposit account authorization is signed and indicates the deposit account number.

From the INTERNATIONAL BUREAU

PCT

FIRST NOTICE INFORMING THE APPLICANT OF
THE COMMUNICATION OF THE INTERNATIONAL
APPLICATION (TO DESIGNATED OFFICES WHICH
DO NOT APPLY THE 30 MONTH TIME LIMIT
UNDER ARTICLE 22(1))

(PCT Rule 47.1(c))

To:

REQU/RECEIVED

FOURNIER, Claude
Brouillette Kosie Prince
25th Floor
1100 René-Lévesque Blvd. West
Montréal, Québec H3B 5C9
CANADA

22 MAR. 2005**BCF S.E.N.C.R.L. / LLP**

Date of mailing (day/month/year) 17 March 2005 (17.03.2005)		
Applicant's or agent's file reference CF/10093-002		IMPORTANT NOTICE
International application No. PCT/CA2004/001493	International filing date (day/month/year) 11 August 2004 (11.08.2004)	
		Priority date (day/month/year) 14 August 2003 (14.08.2003)
Applicant GROUPE RÉFRACO INC. et al		

1. **ATTENTION:** For any designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002 (30 months from the priority date), **does apply**, please see Form PCT/IB/308(Second and Supplementary Notice) (to be issued promptly after the expiration of 28 months from the priority date).

2. Notice is hereby given that the following designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002, **does not apply**, has/have requested that the communication of the international application, as provided for in Article 20, be effected under Rule 93bis.1. The International Bureau has effected that communication on the date indicated below:
24 February 2005 (24.02.2005)

CH

In accordance with Rule 47.1(c-bis)(i), those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

3. The following designated Offices, for which the time limit under Article 22(1), as in force from 1 April 2002, **does not apply**, have not requested, as at the time of mailing of the present notice, that the communication of the international application be effected under Rule 93bis.1:

LU, SE, TZ, UG, ZM

In accordance with Rule 47.1(c-bis)(ii), those Offices accept the present notice as conclusive evidence that the Contracting State for which that Office acts as a designated Office does not require the furnishing, under Article 22, by the applicant of a copy of the international application.

4. TIME LIMITS for entry into the national phase

For the designated Office(s) listed above, and unless a demand for international preliminary examination has been filed before the expiration of **19 months** from the priority date (see Article 39(1)), the applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be **20 MONTHS** from the priority date.

In practice, time limits other than the 20-month time limit will continue to apply, for various periods of time, in respect of certain of the designated Offices listed above. For regular updates on the applicable time limits (20 or 21 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pc/en/index.html>.

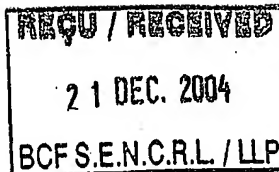
It is the applicant's sole responsibility to monitor all these time limits.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	Authorized officer Athina Nickitas-Etienne Facsimile No. +41 22 338 89 95
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT (PCT Article 18 and Rules 43 and 44)



Applicant's or agent's file reference CF/10093-002	FOR FURTHER ACTION		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/CA2004/001493	International filing date (<i>day/month/year</i>) 11 August 2004 (11-08-2004)	(Earliest) Priority date (<i>day/month/year</i>) 14 August 2003 (14-08-2003)	
Applicant GROUPE REFRACO INC. ET AL			
This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.			
This international search report consists of a total of <u>5</u> sheets. <input checked="" type="checkbox"/> It is also accompanied by a copy of each prior art document cited in this report.			
1. Basis of the report a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item. <div style="margin-left: 40px;"><input type="checkbox"/> the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).</div> b. <input type="checkbox"/> With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I. 2. <input type="checkbox"/> Certain claims were found unsearchable (See Box II). 3. <input checked="" type="checkbox"/> Unity of invention is lacking (See Box III). 4. With regard to the title. <div style="margin-left: 40px;"><input checked="" type="checkbox"/> the text is approved as submitted by the applicant.</div> <div style="margin-left: 40px;"><input type="checkbox"/> the text has been established by this Authority to read as follows : </div>			
5. With regard to the abstract. <div style="margin-left: 40px;"><input checked="" type="checkbox"/> the text is approved as submitted by the applicant.</div> <div style="margin-left: 40px;"><input type="checkbox"/> the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority. </div>			
6. With regard to the drawings, a. The figure of the drawings to be published with the abstract is Figure No. 2 <div style="margin-left: 40px;"><input checked="" type="checkbox"/> as suggested by the applicant.</div> <div style="margin-left: 40px;"><input type="checkbox"/> As selected by this authority, because the applicant failed to suggest a figure.</div> <div style="margin-left: 40px;"><input type="checkbox"/> As selected by this Authority, because this figure better characterizes the invention. b. <input type="checkbox"/> None of the figures is to be published with the abstract. </div>			

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2004/001493

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☐ Claims Nos. :
because they relate to subject matter not required to be searched by this Authority; namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :

3. ☐ Claims Nos. :
because they are dependant claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observation where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

1. Claims 1 - 47 comprising:
 - 1.1 - Claims 1 - 22 comprising a system for measurement of elastic properties of a material comprising at least one impacting device, at least one acoustic detection device and a controller connected to the impacting device and the acoustic detection device.
 - 1.2 - Claims 23 - 32 comprising an impacting device comprising an impacting tip defining a longitudinal axis and an actuator for moving the impacting tip along the axis, the impact tip being mounted to the actuator via a rod.
 - 1.3 - Claims 33 - 37 comprising an acoustic detection device comprising a shock resistant container, a electret microphone mounted in the container via an intermediate shock absorbent material and an electric connection for coupling the microphone to a controller.
 - 1.4 - Claims 38 - 46 comprising a method for determining resonance period of a material.
 - 1.5 - Claim 47 comprising a method for characterizing cracks in a material.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos. :

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos. :

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2004/001493

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC
IPC 7 G01N-3/34

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

US classes - 73/579, 73/12.09, 73/12.12, 307/400

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base, and, where practicable, search terms used)

USPTO - WEST, Classes 73/579, 73/12.09, 73/12.12, 307/400; Keywords: impact and acoustic, controller, refractory, flaws, resonant, acoustic, vibration, elastic, electret and "shock resistant", container, housing, "impacting tip", tip, actuator, cracks

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Measuring Refractory MOE at High Temperature: William L Headrick Jr. Robert E. Moore; Andre Van Leuven; Internet document: URL: http://www.ceramicindustry.com/CDA/ArticleInformation/features/Features_Index/1,2711,9-553,00.html . Posted - October 25, 2000 page 1, lines 2, 15 page 4, paragraph 4,	1, 2, 21, 22
Y	Impulse Excitation Technique for Dynamic Flexural Measurements at a Moderate Temperature; Kevin Heritage, Clayton Frisby; Alan Wofenden; Review of Scientific Instruments, 59(6), June 1988 page 973, introduction page 973 col. 2, line 18 - page 974, col. 2, lines 1 - 16	1, 2, 10, 19
Y	US 5214960 Kiyoshi Tsuboi, 1 June, 1993 col. 3, lines 64 col. 7, lines 3 - 10 col. 8, lines 45 - 62 col. 9, lines 55 - 63 col. 10, lines 4 - 11 col. 12, lines 8 - 9 col. 13, lines 44 - 45, fig. 14 col. 14, lines 41 - 50 col. 15, lines 18 - 30, 35 - 40, 51 - 53	1, 2, 3, 8, 27

Further documents are listed in the continuation of Box C.

Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international-type search
18 November 2004 (18-11-2004)Date of mailing of the international-type search report
17 December 2004 (17-12-2004)Name and mailing address of the ISA/
Commissioner of Patents
Canadian Patent Office - PCT
Ottawa/Gatineau KIA 0C9
Facsimile No. 1-819-953-9358Authorized officer
Patrick Norman (819) 997-2156

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2004/001493

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6301967 B1 Donskoy et al, 16 Oct., 2001 col. 7, lines 24 - 46 Fig. 4	1, 2, 12, 13, 29
X Y	US 6202496 Jakob et al, 20 Mar., 2001 col. 4, line 59 - col. 6, line 32	23, 29 24, 25, 31
X Y	US 4470293; 11 Sept., 1984, Redmon col. 3, line 67 - col. 4, line 25	23 24, 25, 31
X Y	US 2418437 Vogt; 1 April, 1947 col. 2, line 46 - col. 3, line 25 col. 3, lines 48 - 51	23, 28 24, 25, 27, 30, 31
X	US 5506568; 9 April, 1996, Chen col. 2, lines 55 - col. 3, line 2 col. 3, line 34 - col. 4, line 21	33, 34
X	US 5818946; 6 Oct., 1998; Walter col. 3, lines 8 - 11 col. 3, line 45 - col. 4, line 51 col. 5, lines 13 - 22 col. 6, lines 22 - 26 col. 7, lines 3 - 6	33, 35
X	US 4550429; 29 Oct., 1985; Burbank et al Abstract col. 2, line 54 - col. 3, 20 col. 3, lines 38 - 55 col. 3, line 67 - col. 4, line 23	33
Y	Standard Test Method for Dynamic Young's Modulus, Shear Modulus and Poisson's Ration by Impulse excitation of Vibration: ASTM E1876-99. figures 1, 3, 5, 7	9

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2004/001493

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US4550429	29-10-1985	US4550429 A	29-10-1985
US5818946	06-10-1998	US5818946 A	06-10-1998
US5506568	09-04-1996	US5506568 A	09-04-1996
US6202496	20-03-2001	AT277343T T CA2251069 A1 DE19706744 A1 EP0900368 A1 US6202496 B1 WO9837401 A1	15-10-2004 27-08-1998 27-08-1998 10-03-1999 20-03-2001 27-08-1998
US2418437	01-04-1947	US2418437 A	01-04-1947
US5214960	01-06-1993	GB2254426 A US5214960 A	07-10-1992 01-06-1993
US6301967	16-10-2001	AU2572299 A CA2319478 A1 EP1060390 A1 JP2002502030T T US6301967 B1 WO9939194 A1	16-08-1999 05-08-1999 20-12-2000 22-01-2002 16-10-2001 05-08-1999

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
BROUILLETTE KOSIE PRINCE
1100 boul. Rene-Levesque ouest
25^e étage
MONTREAL, Quebec
Canada, H3B 5C9

REQU / RECEIVED

21 DEC. 2004

BCF S.E.N.C.R.L. / LLP

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (date/month/year) 17 December 2004 (17-12-2004)

Applicant's or agent's file reference
CF/10093-002

FOR FURTHER ACTION
See paragraph 2 below

International application n°
PCT/CA2004/001493

International filing date (date/month/year))
11 August 2004 (11-08-2004)

Priority date (date/month/year)
14 August 2003 (14-08-2003)

International Patent Classification (IPC) or both national classification and IPC
IPC 7 G01N-3/34

Applicant **GROUPE REFRACO INC. ET AL**

1. This opinion contains indications relating to the following items :

- | | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input checked="" type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/
Commissioner of Patents
Canadian Patent Office
Box PCT, Ottawa/Gatineau K1A 0C9

Authorized officer

Patrick Norman (819) 997-2156

Facsimile No. (819) 953-9538

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Box No. I

Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language which it was filed, unless otherwise indicated under this item.

- ☐ This opinion has been established on the basis of a translation from the original language into the following language __, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments :

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CA2004/001493

Box No. II Priority

1 ☐ The following document has not yet been furnished :

☐ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2 ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purpose of this opinion, the international filing date indicated above is considered to be the relevant date.

3: Additional observations, if necessary :

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CA2004/001493

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of :

☐ the entire international application

☐ claims Nos. ____

because

☐ the said international application, or the said claims Nos. ____ relate to the following subject matter which does not require an international preliminary examination (*specify*) :

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. ____ are so unclear that no meaningful opinion could be formed (*specify*) :

☐ the claims, or said claims Nos. ____ are so inadequately supported by the description that no meaningful opinion

☐ no international search report has been established for said claims Nos. ____.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that :

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See Supplemental Box for further details.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CA2004/001493

Box No. IV Lack of unity of invention

- 1 ☐ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has :
- ☐ paid additional fees
- ☐ paid additional fees under protest
- ☐ not paid additional fees
- 2 ☒ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
- 3 This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
- ☐ not complied with for the following reasons :
- 4 Consequently, this opinion has been established in respect of the following parts of the international application :
- ☒ all parts
- ☐ the parts relating to claims Nos. ____

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Box No. V reasoned statement under Rule 43bis.1(a)(I) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1 - 22, 24 - 27, 31 - 32, 36 - 47	YES
	Claims	23, 28, 29, 30, 33 - 35	NO
Inventive step (IS)	Claims	4-7, 10- 11, 14 - 18, 26, 36 - 47	YES
	Claims	1 - 3, 8, 9, 12-13, 19-22, 23 - 25, 27 - 35	NO
Industrial applicability (IA)	Claims	1-47	YES
	Claims	none	NO

2. Citations and explanations :

Reference is made to the following documents:

D1 - Measuring Refractory MOE at High Temperature: William L Headrick Jr. Robert E. Moore; Andre Van Leuven; 25 Oct., 2000
D2 - Impulse Excitation Technique for Dynamic Flexural Measurements at a Moderate Temperature; Kevin Heritage, Clayton Fribby; Alan Wofenden; Review of Scientific Instruments, 59(6), June 1988
D3 - US 5214960 Kiyoshi Tsuboi, 1 June, 1993
D4 - US 56301967 Donskoy et al, 16 Oct., 2001
D5 - US 2418437 Vogt; 1 April, 1947
D6 - US 6202496 Jakob et al, 20 Mar., 2001
D7 - US 4470293; Redmon, 11 Sept., 1984
D8 - US 5506568; Chen, 9 April, 1996
D9 - US 5818946; Walter, 6 Oct., 1998
D10 - US 4550429; Burbank et al, 29 Oct., 1985
D11 - Standard Test Method for Dynamic Young's Modulus, Shear Modulus and Poisson's Ration by Impulse excitation of Vibration: ASTM E1876-99.

Novelty:

D5 - discloses an apparatus for tapping electron tubes comprising two solenoids each with a reciprocating plunger, the forward end of which carries a small tip of felt, rubber etc. Each solenoid has two windings to permit reciprocal motion and the windings are arranged to be energized alternately. Each plunger may be equipped with an optional spring bias so that the plunger is held away from the tube under test. Also each plunger may be equipped with shoulders adjacent the ends cooperating with inward shoulders to act as stops. The subject matter of claims 23, 28 and 30 cannot therefore be considered to be novel in view of D5. (Article 33(2) PCT)

D6 - discloses a device for measuring the elastic-visco properties of objects comprising a housing and an actuator consisting of a stacked piezo electric element having a tip connected to the piezo element via a connecting element. The subject matter of claims 23 and 29 cannot therefore be considered to be novel in view of D6. (Article 33(2) PCT)

D7 - discloses an impact device for testing insulation comprising a gun shaped housing having a plunger driven by a spring and equipped with a tip (hammer head). The subject matter of claims 23 cannot therefore be considered to be novel in view of D7. (Article 33(2) PCT)

D8 - discloses a shock sensor comprising a housing containing an electret microphone with a metallic jacket, mounted in a flexible support made of silicon rubber, with a weight and two air chambers which act as shock absorbers. The device has an electric connection. The subject matter of claims 33 and 34 cannot therefore be considered to be novel in view of D8. (Article 33(2) PCT)

D9 - discloses a ruggedized hearing aid containing an electret microphone. The microphone is acoustically and mechanically isolated by a sound receiver port and steel and elastomeric washers and is connected to an electronic circuit. The subject matter of claims 33 and 35 cannot therefore be considered to be novel in view of D9. (Article 33(2) PCT)

D10 - discloses a microphone loudspeaker arrangement wherein the microphone is an electret type microphone and is mounted to avoid mechanical shock and having wires for electrical connection to the circuit. The subject matter of claim 33 cannot therefore be considered to be novel in view of D10. (Article 33(2) PCT)

Inventive step:

D1 - discloses modulus of elasticity (MOE) measurements at high temperature for refractory materials comprising a pneumatic tapping device and a microphone along with a thermocouple assembly for temperature measurement. The device is controlled by a computer. Not specifically shown is that the controller is connected to both the impacting device and the acoustic receiver.

D2 - discloses an impulse excitation technique (IET) to measure Young's modulus in pure aluminum. The apparatus consists of an impactor (small steel balls) and a microphone pickup. The received sound waves are passed to an electronics box for Fourier analysis. Not specifically shown is that the controller is connected to both the impacting device and the acoustic receiver.

Continued in supplemental box.

)
**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

Application No.
Patent No.

Publication date
(day/month/year)

Filing date
(day/month/year)

Priority date (valid claim)
(day/month/year)

2. Non-written disclosures (Rule 43bis.1 and 70.9)

Kind of non-written disclosure

Date of non-written disclosure
(day/month/year)

Date of written disclosure
referring to non-written disclosure
(day/month/year)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted :

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

Page, 20, line 24. The word Teflon may be a trademark and should be identified as such.

Claim 9. The word relatively should probably be relative

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/001493

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of : box V

D3 - discloses a method and apparatus for detecting defects such as cracks in an object. It consists of a mechanical vibrator which can strike the object simultaneously or sequentially at one or several locations, combined with a pickup device for picking up resulting vibrations and an arithmetic decision system and controller for analysis of the resulting vibrations. The controller is shown to be connected to both the impactor and the pickup device. The pickup device is noted to be a displacement meter or the like with a sharp directivity.

D4 - discloses a method and apparatus for detecting defects such as cracks in an object. It consists of an impact hammer to strike the device and an ultrasonic receiver to pickup the resulting vibrations which are then analysed by a computer system.

D11 - discloses a method and apparatus for determining elastic properties in a rectangular sample block by impulse excitation or vibration. The method and apparatus are used to measure in plane and out of plane flexure, torsional flexural and longitudinal flexure.

The device of claim 1 differs from D1 and D2 only in not specifically showing that the computer or controller is connected to both the impactor and receiver. However both D3 and D4 show this features. It is obvious that a person of skill in the art could configure either of the devices of D1 or D2 in the manner shown by D3 or D4 to arrive at the invention as claimed. Therefore the device of claim 1 cannot be considered to be inventive in view of D1 with regard to D3 or D4, or in view of D2 with regard to D3 or D4. (Article 33(3) PCT)

Claims 2, 3, 8, 9, 12 - 13, 19 - 22, 24 - 25, 27, 31 - 32 lack an inventive step. (Article 33(3) PCT)

Claim 2 would be an obvious design choice to a person of skill in the art because they would consider which pickup device best suited their requirements. D11 teaches the use of a microphone, a contact accelerometer such as piezoelectric or strain gauges, or laser, magnetic or capacitance methods for signal pickup. Therefore it is not thought to add an inventive step in view of D11. (Article 33(3) PCT)

The subject matter of claim 3 is disclosed by D2. See page 973, col. 2, lines 20 - 23. Therefore it is not thought to add an inventive step to the independent claims in view of D2. (Article 33(3) PCT)

The subject matter of claim 8 is disclosed by D3. See col. 9, lines 2 - 13. Therefore it is not thought to add an inventive step to the independent claims in view of D3. (Article 33(3) PCT)

The subject matter of claim 9 is disclosed by D11. See figures 1, 3, 5 and 7. Therefore it is not thought to add an inventive step to the independent claims in view of D11. (Article 33(3) PCT)

The subject matter of claims 12 and 13 is disclosed by D4. See figure 4. Therefore it is not thought to add an inventive step to the independent claims in view of D4. (Article 33(3) PCT)

The subject matter of claim 19 is shown by D2. See page 974 under Test Results, i.e., a pure aluminum specimen. Therefore it is not thought to add an inventive step to the independent claims in view of D2. (Article 33(3) PCT)

Claim 20 is considered to be a design choice for the person of skill since they would choose the appropriate material to test. D1 for example teaches testing of refractory material. D2 teaches testing of aluminum. Therefore it is not thought to add an inventive step to the independent claims in view of D1 and D2. (Article 33(3) PCT)

The subject matter of claims 21 and 22 is shown by D1 which notes that the material being tested is refractory material such as alumina and cement. See page 3 under experimental procedures. Therefore it is not thought to add an inventive step to the independent claims in view of D1. (Article 33(3) PCT)

Claims 24 and 25 are considered to be a design choice for the skilled person since they would be able to choose what form the impacting tip had to best suit their needs and since various impacting tips are shown by D5, D6, D7. Therefore it is not thought to add an inventive step to the independent claims in view of either one of D5, D6, D7. (Article 33(3) PCT)

The subject matter of claim 27 is considered obvious in view of D5. See col. 3, lines 5 - 8. A person of skill would be able to design the circuit to strike either alternatively as in D5 or repetitively. Therefore it is not thought to add an inventive step to the independent claims in view of D5. (Article 33(3) PCT)

The subject matter of claims 31 - 32 is considered to be an obvious design choice. D2 teaches placement of support structures at particular locations and the use of a low friction material would be an obvious choice since it would have less effect on the results. Therefore it is not thought to add an inventive step to the independent claims in view of D2. (Article 33(3) PCT)

The remaining claims 4 - 7, 10 - 11, 14 - 18, 26, 36, 37 and 38 - 47 meet the requirements for novelty and inventive step because the prior art does not teach or fairly suggest their subject matter.

Claims 1-47 meet the requirements for industrial applicability. (Article 33(4) PCT)